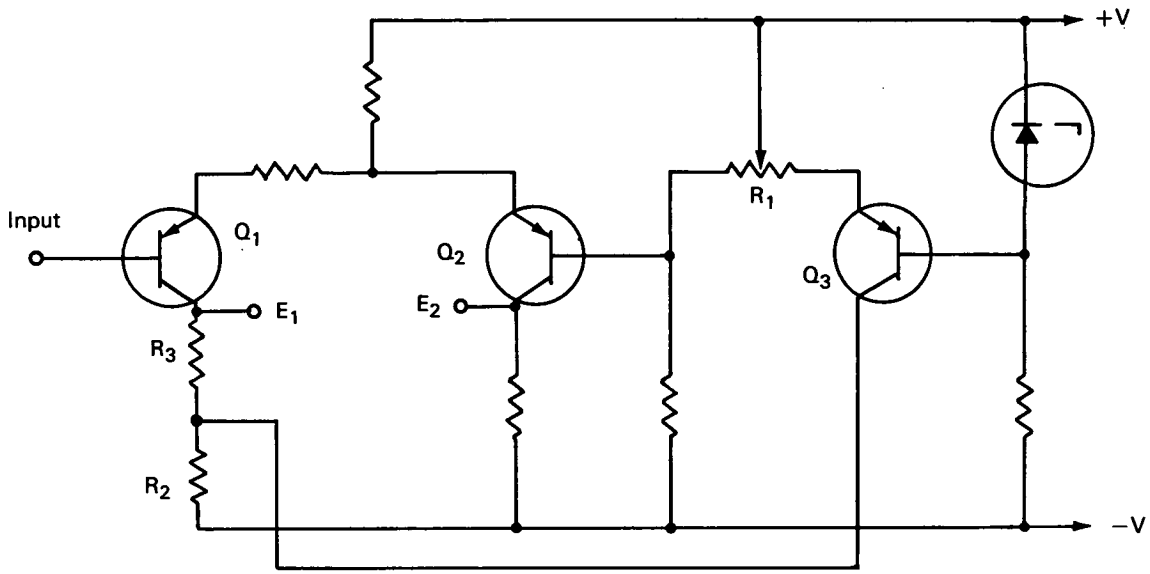
NASA TECH BRIEF

Phase Inverter Provides Variable Reference Push–Pull Output



The problem:

To design a circuit that will provide a push–pull output referenced to a dc potential which can be varied without affecting the signal levels.

The solution:

A dual-transistor difference amplifier which provides the push–pull output, coupled with a feedback circuit which can vary the operating points of the transistors by equal amounts to provide variable reference potentials.

How it's done:

The difference amplifier consists of Q_1 and Q_2 and their associated components. The output signals, E_1 and E_2, appear at the collectors of the respective transistors and are 180° out of phase. The operating points of Q_1 and Q_2 with respect to either +V or −V are varied by varying R_1. If R_1 is varied in a direction that increases the positive bias on the base of Q_2, it will make Q_2 conduct less and cause E_2 to become more negative. Moving R_1 in this direction also increases the emitter resistance of Q_3 which causes Q_3 to conduct less, and decreases the current flow through the common resistor R_2. The voltage drop across R_2 and R_3 will therefore decrease, and E_1 will become more negative. The reference potentials, E_1 and E_2, have therefore varied in the same direction with respect to +V or −V, but the gains of Q_1 and Q_2 have not changed.

Notes:

1. This circuit was designed to drive a dc-coupled push–pull deflection amplifier, using R_1 as a centering control.

(continued overleaf)

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
NASA Headquarters
400 Maryland Avenue, SW
Washington, D.C. 20546.
Reference: B66-10344

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Radio Corporation of America
under contract to
NASA Headquarters
(HQ-23)